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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,349	03/30/2004	Tomoo Iijima	040158	2684
38091	7590	10/31/2005	EXAMINER	
TESSERA LERNER DAVID et al. 600 SOUTH AVENUE WEST WESTFIELD, NJ 07090			LE, THAO X	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 10/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

**Office Action Summary**

Application No.

10/812,349

Applicant(s)

IIJIMA ET AL.

Examiner

Thao X. Le

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 52-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 52-59 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>03/30/04</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of claims 1-5 in the reply filed on 23 Sept. 2005 is acknowledged. Furthermore, claims 1-51 are canceled and new claims 52-57 are added and are being considered.

### ***Drawings***

2. Figures 13A-13I should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 52, 54, 56 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6329610 to Takubo et al.

Regarding claim 52, Takubo discloses a wiring circuit panel in fig. 3 comprising: a first metal layer 14a, col. 15 line 40 including a wiring circuit pattern 14 ; a plurality of discrete solid metal bumps 33, col. 16 line 27, overlying a surface of said first metal layer 14a; an insulating film 22, col. 15 line 43, overlying said surface of said first metal layer 14a, wherein tops of said plurality of metal bumps 33 extend upward through openings in said insulating film 22; and a plurality of solder balls 43, col. 19 line 30, overlying said tops of said plurality of metal bumps 33, said solder balls 43 being in conductive communication with said metal bumps 33.

Regarding claim 54, Takubo discloses the wiring circuit panel as claimed in claim 52, wherein at least a portion of said insulating film 22 is flexible, col. 15 line 44.

Regarding claim 56, Takubo discloses a circuit module in fig. 3 comprising: a flexible circuit panel including a first metal layer 14 including a wiring circuit pattern 14a; a plurality of discrete solid metal bumps 33 overlying surface of said wiring circuit pattern 14a; a substantially flexible insulating film 22, col. 15 line 44, overlying said surface of said wiring circuit pattern 14a, wherein tops of said plurality of metal bumps 33 extend upward through openings in said insulating film 22; and a plurality of solder balls 43 overlying said tops of said plurality of metal bumps 33, said solder balls 43 being in conductive communication with said plurality of metal bumps 33; and a second circuit panel 21 having a substantially rigid dielectric element 21, col. 15 line 41, and a second wiring circuit pattern 12, col. 15 line 40, overlying at least a portion of said

dielectric element 21, wherein said second circuit panel 21 is joined to said flexible circuit panel 22 such that said second wiring circuit pattern 12 conductively communicates with said flexible wiring circuit pattern 14 through said plurality of metal bumps 33, fig. 3.

5. Claims 52-54 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6050832 to Lee et al.

Regarding claim 52, Lee discloses a wiring circuit panel in fig. 1 comprising: a first metal layer 26, col. 4 line 61, including a wiring circuit pattern 26 ; a plurality of discrete solid metal bumps 28, col. 4 line 47, overlying a surface of said first metal layer 26; an insulating film 18 (interposer), col. 9 line 1, overlying said surface of said first metal layer 26, wherein tops of said plurality of metal bumps 28 extend upward through openings in said insulating film 18,; and a plurality of solder balls 16, col. 4 line 55, overlying said tops of said plurality of metal bumps 28, said solder balls 16 being in conductive communication with said metal bumps 28, col. 4 lines 54-55.

Regarding claims 53-54, Lee discloses the wiring circuit wherein the first metal layer 26 and plurality of bumps consist essentially of copper, col. 9 line 27, wherein at least a portion of insulating film 18 is flexible, col. 9 line 1.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 53, 55, 57-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6329610 to Takubo et al. in view of Applicant Admitted Prior Art (APA).

Regarding claims 53 and 59, Takubo discloses the wiring circuit panel wherein first metal layer 14 consists essentially of copper, col. 15 line 51.

But, Takubo does not disclose the wiring circuit panel wherein the metal bump 33 consists essentially of copper, wherein said plurality of metal bumps 33 and said first metal layer each consist essentially of a first metal.

However, APA discloses the wiring circuit panel wherein first metal layer 10(20c) and metal bump 6 (20c) consists essentially of copper, specification page 2 lines 10-16. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the copper connecting layer teaching of APA with Takabo's device, because such copper interconnection is typical in the art or conventional as disclosed by APA.

Regarding claim 55, Takubo does not disclose the wiring circuit panel as claimed in claim 52 wherein said tops of each of said plurality of metal bumps 33 include an upwardly facing concave surface and said plurality of solder balls contact said concave surfaces of said plurality of metal bumps.

However, APA discloses the wiring circuit panel as claimed in claim 52 wherein said tops of each of said plurality of metal bumps 6 include an upwardly facing concave surface, fig. 13G, and said plurality of solder balls 12 contact said concave surfaces of said plurality of metal bumps 6. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the concave surface the teaching of APA with Takubo's device, because it would have provided a better mating surface for the solder ball. Furthermore, the Applicant has no support data, which convinces that the particular claimed configuration is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for the purpose of providing mating surfaces. In re Dailey 149 USPQ 47, 50 (CCPA 1966). See also Glue Co. v. Upton 97 US 3,24 (USSC 1878).

Regarding claim 57, Takubo discloses the wiring circuit panel as claimed in claim 52, the first metal layer 14a, said plurality of metal bumps 33 overlying said first metal layer.

But, Takubo does not disclose the wiring circuit panel further including a second metal wherein said second metal layer is an etch stop layer which

substantially resists an etchant which would attack a first metal included in said first metal layer.

However, APA discloses the wiring circuit panel further including a second metal 8 (20b) wherein said second metal layer is an etch stop layer which substantially resists an etchant which would attack a first metal 10 (20c) included in said first metal layer, specification page 3 lines 1-7. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the second barrier layer 8 (20b) teaching of APA with Takubo's, because it would have provided the protection for the wiring layer as taught by APA, specification page 3 lines 6-7.

Regarding claim 58, Takubo discloses the wiring circuit panel as claimed in 57 comprises plurality of metal bumps 33

The process limitations 'metal bumps are formed by etching a third metal layer overlying said second metal layer' in claim 58 do not carry weight in a claim drawn to structure. In re Thorpe, 277 USPQ 964 (Fed. Cir. 1985).

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

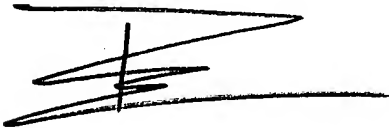
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone



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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'Thao X. Le', with a stylized, somewhat abstract form.

Thao X. Le  
20 Oct. 2005